

Sept. 7, 1965

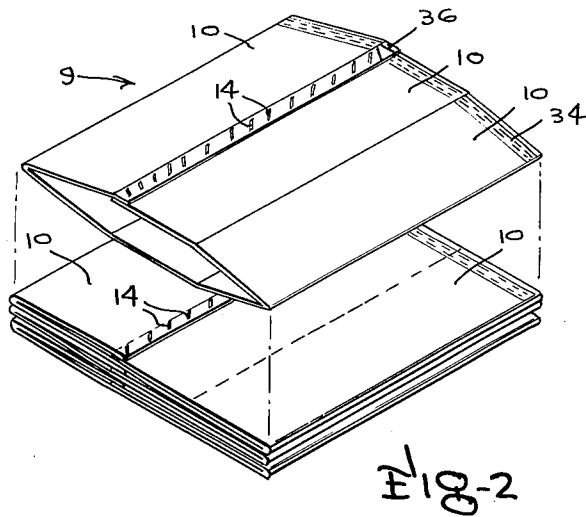
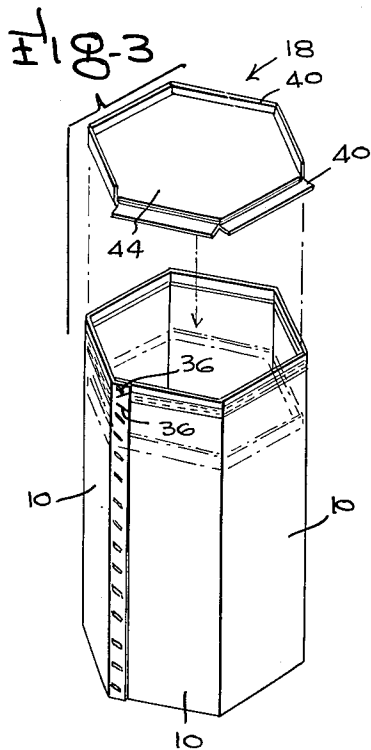
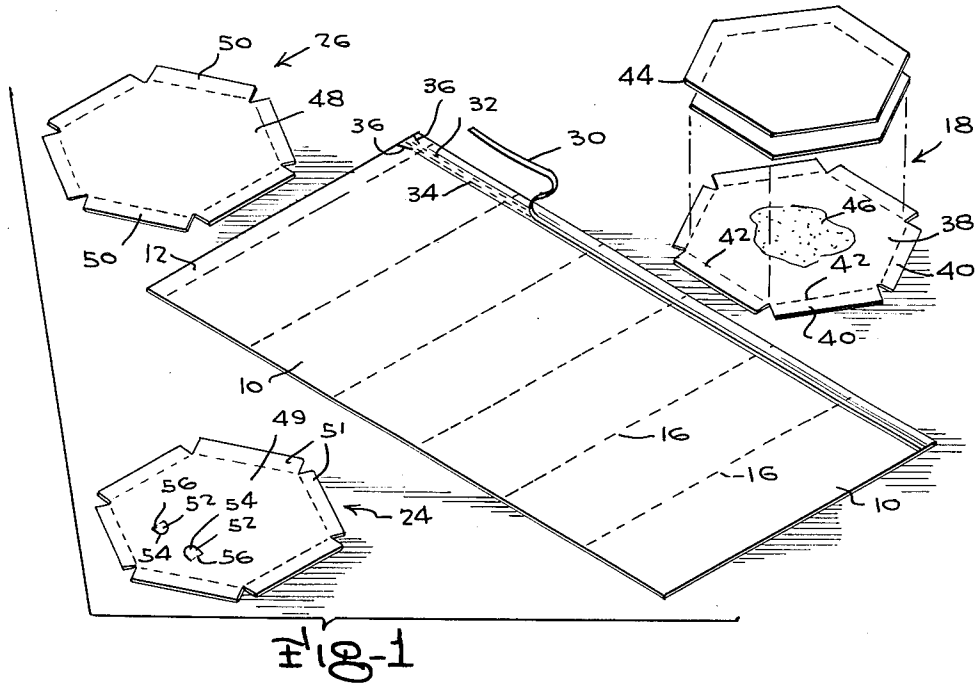
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3,204,849

HEXAGONAL, CORRUGATED SHIPPING CONTAINER

Filed June 21, 1963

3 Sheets-Sheet 1



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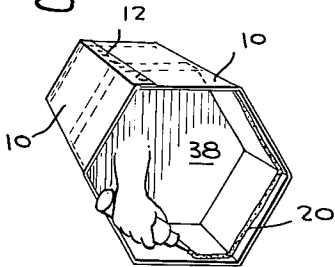
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HEXAGONAL, CORRUGATED SHIPPING CONTAINER

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Fig-4



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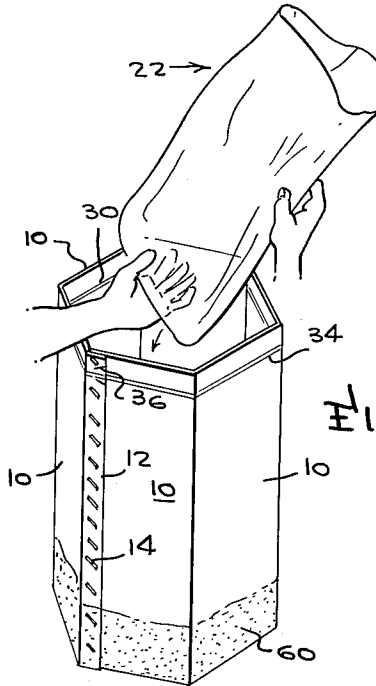


Fig-6

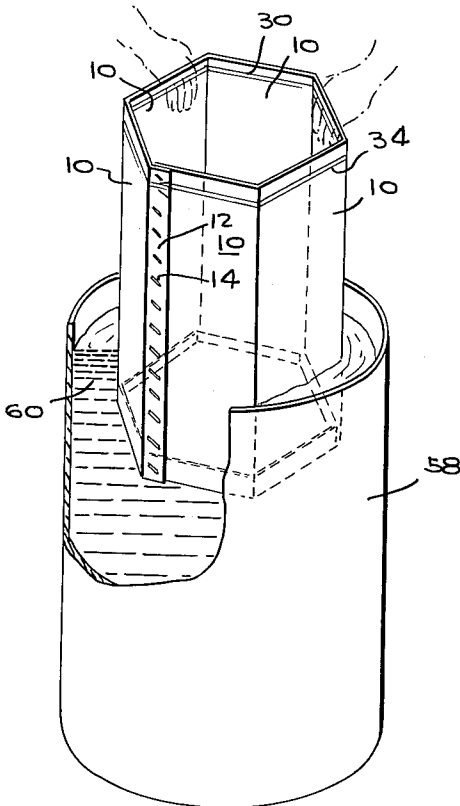


Fig-5

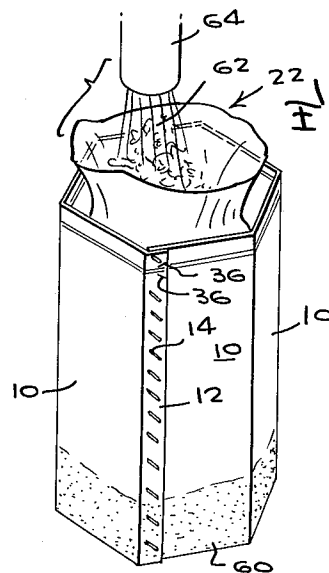


Fig-7

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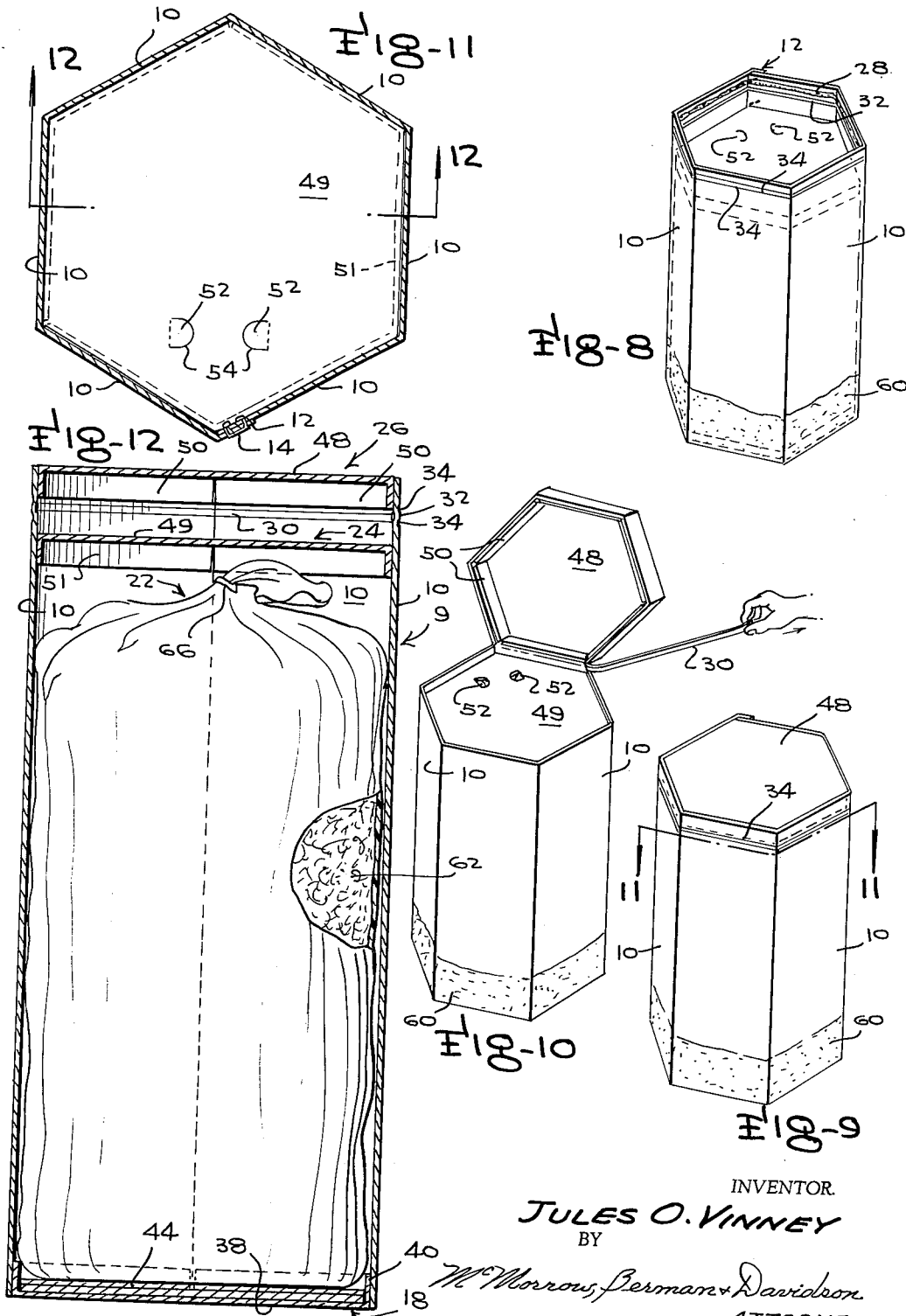
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HEXAGONAL, CORRUGATED SHIPPING CONTAINER

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3 Sheets-Sheet 3



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3,204,849 HEXAGONAL, CORRUGATED SHIPPING CONTAINER

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Filed June 21, 1963, Ser. No. 289,575
3 Claims. (Cl. 229—6)

This invention relates to a container for merchandising materials, especially powdered, granular or other flowable forms of relatively dry materials, although not limited to the handling of any specific forms of material. It is also concerned with containers of sizable weight capacity, on the order of 100 pounds, net, for example, but again, the capacity or size can be varied within wide limits.

A typical example of material to be handled is a chemical adapted for spreading on deposits of snow or ice, to cause melting. Heretofore, this material, like many others, has been packaged in fiber drums of circular cylindrical form, and while these have the advantage of being strong and rugged in use, yet they are subject to many serious shortcomings. For instance, they are wasteful of space, both in shipping and storage, and especially in the matter of empty drum inventory, and hence costly, as well as being additionally costly as to manufacture, and the material from which they are made. In addition, they have failed to provide adequate protection of the contents against deterioration during storage and shipment, due to inadequate sealing, and to corrosion in the case of metal containers, and also after initial opening, and have, furthermore, been subject to tampering, with resultant diminishing or adulteration of the contents, to the detriment of the ultimate consumer. They also usually require tools for opening. As another drawback, the impracticality of imprinting legends on the container necessitates the use of labels, which is an item of major expense, running as high as 14 cents per item in the illustrative case considered.

It is, therefore, a general object of the invention to provide a container which shall be free of the shortcomings enumerated, as well as others.

More particularly, it is one object of the invention to provide a container capable of fully utilizing all available space in storage and shipping. In still greater particular, it is an object to provide a container as aforesaid which, in addition, is collapsible to flat condition, so as to be even more conserving of space when stored or shipped, prior to filling. Otherwise stated, it is an object to provide a container of polygonal section, having ruggedness and sturdiness comparable to a container of circular section.

Another general object is to cut costs of packaging and shipping, without sacrifice to durability and strength, particularly resistance to damage during rolling on a bottom edge.

Yet another object is to provide improved protection for the contents, during storage and shipping, and after initial opening for dispensing.

Another object is to thwart tampering.

A still further object is to provide a container adapted for application of printed legends or messages in maximum degree, at relatively small cost.

Another specific object is to provide a container having improved closure caps, and particularly one with a pair of caps at one end, one of which is discardable, and the other of which is intermittently applicable. An object related to the foregoing is the provision of a tear strip between the pair of caps, for removing the end of the container carrying the outer one of the pair of caps.

These and other objects, which will be apparent, are attained by the present invention, a preferred form of which is described in the following specification, as illustrated in the drawings, in which:

FIGURE 1 is a bracketed view, in perspective, of the several parts of the container in their original, planiform condition, prior to assembly of the container,

FIGURE 2 is a perspective view of a stack of container wall sections, after stapling the ends of the blank together to form a tube, and the tubes being flattened for piled storage,

FIGURE 3 is a perspective view of a wall section, expanded to tubular form, in position to receive a bottom closure member through the top opening, a subsequent position of the top closure member being indicated in dash lines,

FIGURE 4 is a perspective view of the tube of FIGURE 3, laid on its side after partial insertion of the bottom closure member, and showing a line of adhesive for the bottom closure member being applied,

FIGURE 5 is a perspective view of the container with its bottom being dipped in a moisture-proofing solution after fixation of the bottom closure member in place,

FIGURE 6 is a perspective view of the container of FIGURE 3, shown receiving the inner, plastic bag or liner,

FIGURE 7 is a perspective view of the container, after placement of a plastic liner within, and showing a delivery device charging material into the liner,

FIGURE 8 is a perspective view of the container, after placement of the inner, top closure member over the inner bag or liner,

FIGURE 9 is a perspective view of the container after placement and adhesive engagement of the outer, top closure member,

FIGURE 10 is a perspective view of the container after partial removal of the end containing the outer, top closure member, by means of the tear strip,

FIGURE 11 is a transverse sectional view through the container, taken on the line 11—11 of FIGURE 9, and FIGURE 12 is a sectional view taken on the longitudinal plane of the line 12—12 of FIGURE 11.

Referring to the drawings by characters of reference, there is shown in FIGURES 11 and 12, a complete, closed and sealed container 9 of tubular form, and hexagonal cross section, the side walls of which comprise six identical, elongate panels 10, of rectangular form, with a relatively narrow flap 12 on the outer edge of one end panel, adapted to overlap the other end panel, in the tubular development from the plane, blank form, where it is secured as by staples 14. With reference to FIGURE 1, it will be seen that the panels 10 are defined by score marks 16, which not only facilitate bending of the side wall blank into the tubular form, but also guarantee its accuracy, and enhance the strength of the container.

An upwardly open, cup-shaped, bottom closure 18 is secured in the bottom opening of the container wall by a suitable adhesive 20 (FIGURE 4) such as polyvinyl acetate. An inner, plastic bag or liner 22, is supported on the bottom closure. An inner, inverted top closure 24, is friction-fitted in the container, in superposed relation to the liner bag 22, with an outer, inverted top closure 26, secured in the top opening of the container tube, above inner closure 24, and secured by adhesive 28 (FIGURE 8) similar to adhesive 20. A tear strip 30, is secured to the inner surface of the container tube, on a peripheral line between the outer and inner top closures.

For cooperative action with the tear strip 30, the wall of the container is crimped so that an annular groove 32 appears on the inner face, in which groove the tear strip 30 is received, and above and below this inner groove, the wall is weakened by a pair of annular grooves 34 formed in the exterior surface. With further reference to FIGURES 1, 3, 6 and 7, it will be seen that in the overlap tab 12 of the container wall, the pair of grooves 34 diverge in fishtail form along lines 36, to

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provide a terminal end, which is readily grasped by the thumb and fingers to start the tear. The region of this end tab should, of course, be free of staples or other forms of fastening.

As seen in FIGURE 1, the end closures are made from flat stock, with main central sections, of hexagonal form, adapted to fit snugly in tube 9. Thus, bottom closure 18, of three-ply construction, has an outer unit with a central, hexagonal panel 38, having on each edge an extending, rectangular tab 40, the blank being suitably scored along lines 42, at the bases of the tabs, for upward folding of the tabs. When thus folded upwardly, tabs 40 envelop the edges of a pair of hexagonal layers of laminae 44, which are superimposed on panel 38, and secured by adhesive 46, similar to adhesive 20.

Outer, top closure member 26 is in all respects the same as the bottom layer 38 of bottom closure 18, with hexagonal panel 48, and outer tabs 50, and inner, top closure member 24 is also the same with panel 49 and tabs 51, and has, in addition, a pair of curvate tabs, 52 cut along lines 54, and foldable along score lines 56, to provide access holes for a thumb and finger, to grasp the closure for removal from the container. When in place in the container, all closures are concave inwardly thereof.

As shown by the blanks of FIGURE 1, manufacture of the container is initiated by cutting or stamping the parts from flat stock, with no scrap in the case of the wall element 9, and very little in the case of the hexagonal, closure blanks. Of the latter, elements 18, 24 and 26 may all be cut by the same die, with the finger holes in element 24 applied separately. The tear-strip grooves 32, 34 may be made concurrently with the die-cutting of the wall element 9, and also the score lines 16, as well as the cut lines 36 defining the grasping tab for the tear strip. With the blank for the wall thus provided, the tear strip 30 is laid down along the inside groove 32, where it is secured by an adhesive such as the polyvinyl acetate used throughout. The blank thus formed is rolled into hexagonally tubular form by bringing end edges together, with marginal piece 12 overlapping an end panel, and secured by staples 14. The wall section thus formed is then shaped for storage and shipping, by collapsing along a diagonal plane, through the tube axis and two opposite vertices, which may be any pair which do not include the overlapping tab 12, for obvious reasons. The resulting form, and the compact piling in storage, are illustrated in FIGURE 2.

Top closures 24 and 26 are ready for use, as stamped, after the operation of folding the edge tabs, and for convenience, these could be carried within the collapsed tube, but for large scale production, space economy will favor the retention of the parts in separate piles. In such case, the hexagonal form also contributes space-saving features. In the case of bottom closure 18, the original manufacture will include the attachment of the two extra plies 44 to the panel 38.

For assembly, incidental to a filling operation, a wall element 9 is lifted from the stack of collapsed elements, and expanded into a rough approximation of its ultimate tubular form, by hand manipulation. This shaping is further refined by the expedient of introducing the bottom closure 18 through the top opening, as indicated in FIGURE 3, and sliding it throughout the entire length of the tube, to its ultimate position at the bottom, where its outer surface is flush with the bottom edge of the wall section (FIGURE 12). The bottom closure thus functions additionally as a shaping jig, and midway of its movement, it will be found convenient to apply a line of adhesive 20, as shown in FIGURE 4. This is spread on a line at the uppermost portion of closure 18, as finally located, so that in the final movement of positioning the closure, the adhesive is efficiently spread, not only with secure attachment of the closure, but also attendant economies, as well as rigidity of the container. In fact,

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with a three-ply closure, attached in the manner described, a container of hexagonal form may be moved about, in rough handling, by rolling on a lower edge, with as much impunity as a circularly tubular container, with either an integral bottom, or a highly secure closure. In fact, the bottom closure is so firmly lodged that it would require a heavy hammer blow to disturb it.

Following the final attachment of the bottom closure, it will be helpful to waterproof at least the lower end of the container, as illustrated, for instance in FIGURE 5, where the lower part of the container is shown as being immersed in a vat 58, containing a suitable waterproofing fluid 60, such as alkyd compounds, paraffin compounds, or the like. The resulting coating 60 is indicated in FIGURE 6. This will dry sufficiently in about two hours for further processing, but it will be preferable to allow more time, up to twelve hours, for instance.

FIGURE 6 also shows the step of inserting the bag 22, which may be a high density polyethylene, about three mils in thickness. With the bag in place in the container, a precisely controlled amount of the granular material 62 is deposited into the bag 22 from the discharge end of a pipe 64, which may be part of an automatic weigher-filler (not shown). After the proper quantity of material has been charged into the bag, the top opening thereof is sealed off in a "choke" closure, maintained by a looped and twisted strand of wire 66.

Following closure of the bag, the inner top closure 24 is folded peripherally, and inserted into the container, with concavity downward, and in covering relation to the bag 22. This closure is not attached to the container, but held in a frictional, or loose, sliding fit, compatible with the purpose of removing and replacing it from time-to-time, if and as required. Removal, in such case, is facilitated by the finger holes in the closure.

After insertion of the inner, loose closure comes the final packaging step of inserting the outer, top closure 26. Prior to such insertion, the line of adhesive 28 is applied, as shown in FIGURE 8, near the top edge of the container, so that, as in the case of the bottom closure, the line of adhesive is picked up by the advancing closure, and spread out in a film which provides intimate and extensive coverage. Thus the outer, top closure is thoroughly secure against accidental dislodgment, or deliberate tampering, which guarantees to the customer a product which is in original condition, undiminished and unadulterated.

At the time of use, it is only necessary for the consumer to grasp the end tab of the tear strip and pull. The result is a cutting off of the top of the container, on a line between the outer closure and the inner closure, after which the outer closure may be discarded. In the process, of access, the next step is to lift out the inner closure 24, in which the finger holes therein are used to advantage, after which the wire 66 is untwisted to free the top of the bag for opening, after which the contents of the bag may be removed in any convenient manner. If the entire contents are not dispensed in any given operation, the balance may be accorded a reasonable measure of protection, by again choking off the bag mouth, and replacing the inner closure 24.

From the foregoing it will be seen that a container has been provided which attains the above-enumerated objects in ample measure. The container, which is economical enough to warrant discarding after a single use, also cuts over-all packaging and shipping costs by about 20%, as compared with existing methods and systems, due mainly to economy of space, not only as to the filled container, but additionally and especially as to the compactness of the container prior to filling, wherein, in either case, 100% utilization of available space is possible. In fact, in actual practice it has been found that the same space required to store 500 cylindrical drums would accommodate 5,000 of the knocked-down, hexagonal containers.

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With the triple lamination of double wall corrugated stock (275 lb.) in the bottom closure, plus the tenacious adhesive, as efficiently applied in the novel manner set forth herein, the bottom region of the container is endowed with a degree of durability and ruggedness which is equal to the measure of rough handling to be expected in connection with transport, for any reason. Furthermore, the bottom dip provides a protective coating which permits storage in very moist regions, without degradation, or product damage, even in the case of minor flooding.

In addition, the container is capable of being rapidly set up, for easy filling, and provides extended protection in the case where dispensing is effected in a series of stages, a companion feature being an inner cover for repeated use, which is easily handled for removal. The tear strip, which is peculiarly related to the dual, top closures, since it makes for easy opening, enables the use of a thoroughly sealed closure, with the result that tampering is discouraged, if not thwarted, since access can only be had by a degree of destruction of the container which is immediately evident, and is irreparable.

Of no less importance than any of the foregoing is that the use of flat stock enables extensive imprinting, without resort to labels, with the result that eye appeal is enhanced, and the aims of the sales mission furthered, by extensive use of pictures and words, with a potential for artistry, psychology, and appeal in general.

While a certain preferred embodiment has been shown and described, various modifications will be apparent, in the light of this disclosure, and the invention should not, therefore, be deemed as limited, except insofar as shall appear from the spirit and scope of the appended claims.

What is claimed is:

1. A container comprising an elongated flat blank having inner and outer faces facing upwardly and downwardly respectively and a top and a bottom, said blank being subdivided into a plurality of panels of like size by score lines extending between adjacent panels from the top to the bottom thereof, a narrow flap extending along one of the end panels of said blank and connected to said one end panel by a score line, the inner face of said blank being provided with a groove extending along and spaced inwardly from and adjacent the top of said blank and from said flap to said other end panel, there being a wall weakening groove in the outer face of said blank on each side

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of and parallel to said inner face groove and extending the full length of said inner face groove, a tear strip mounted within the inner face groove and having a terminal end projecting through said flap, said blank being foldable upon itself so that said flap projects over and overlies a like portion of said other panel, and fastening means securing said flap to the overlapping portion of said other panel to thereby form a hollow tube of polygonal form in a collapsed state, said tube being shiftable from the collapsed state to an expanded state, said tube when in the expanded state having an inner inverted cup-shaped closure insertable through the top of said tube to a position below and adjacent the wall weakening groove remote from the top of said tube, said closure slidably and frictionally engaging the wall of said tube, and an outer inverted cup-shaped enclosure insertable through the top of said tube to a position between the top of said tube and the wall weakening groove adjacent the top of said tube, said outer closure being fixedly secured to the wall of said tube, application of a pulling force upon the terminal end of said tear strip causing said tear strip to be removed and thereby permit the upper closure and the portion of the tube above the inner closure to be removed from the tube.

2. The container according to claim 1, which includes in addition a bottom upstanding cup-shaped closure insertable through the top of said tube to a position such that the bottom is flush with the bottom of said tube, said bottom closure being fixedly secured to said tube.

3. The container according to claim 1, wherein the bottom of said inner closure is provided with curvate tabs foldable along score lines for providing holes for the thumb and finger of an operator to remove said inner closure.

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